

**Chromatographic, spectroscopic and mass spectrometric approaches for
exploring the habitability of Mars in 2012 and beyond with the Curiosity
Rover**

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The Sample Analysis at Mars (SAM) suite of instruments on the Curiosity Rover of Mars Science Laboratory Mission is designed to provide chemical and isotopic analysis of organic and inorganic volatiles for both atmospheric and solid samples. The goals of the science investigation enabled by the gas chromatograph mass spectrometer and tunable laser spectrometer instruments of SAM are to work together with the other MSL investigations is to quantitatively assess habitability through a series of chemical and geological measurements. We describe the multi-column gas chromatograph system employed on SAM and the approach to extraction and analysis of organic compounds that might be preserved in ancient martian rocks.